(54) Title: METHOD AND APPARATUS FOR DISPLAYING TEXTUAL OR GRAPHIC DATA ON THE SCREEN OF TELEVISION RECEIVERS
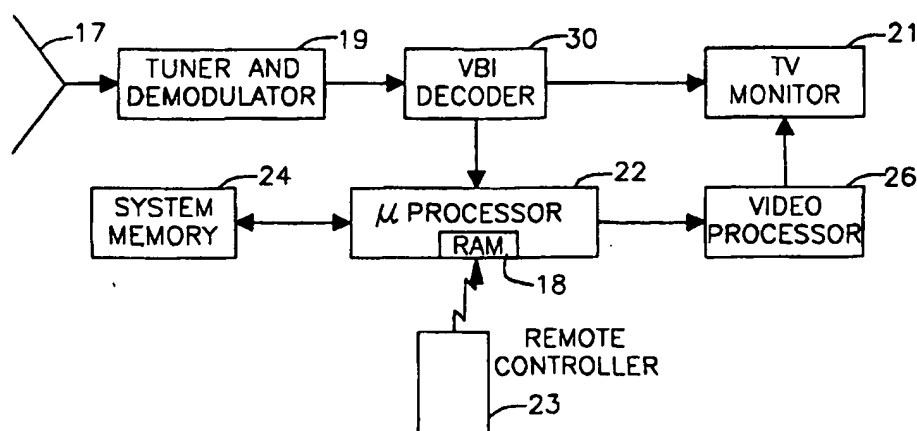
(57) Abstract

A local language is pre-stored in permanent memory (24). Equivalent data is transmitted in the vertical blanking interval (VBI) to television receivers (17). Each equivalent data set comprises a unique language identifier (38) and a foreign language translation (36) of, or graphical representative of, the local language pre-stored in permanent memory. The viewer selects the language to be displayed from an on screen menu with a remote controller (23). The selected equivalent data is retrieved from the VBI and stored in a RAM (18) for future display. When the microprocessor calls up the text of a command for display, the equivalent data is substituted for the local language data so the foreign language version of the command can be displayed in a seamless manner. If no equivalent data is stored in the RAM, the local language pre-stored in permanent memory is displayed on the television screen in accordance with the normal operation of the microprocessor.

METHOD AND APPARATUS FOR DISPLAYING TEXTUAL OR GRAPHIC DATA ON THE SCREEN OF TELEVISION RECEIVERS

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Background of the Invention

This invention relates to displaying textual or
graphic data on a television screen, and more particularly to a method and apparatus for
10   displaying video cassette recorder (VCR) and/or television programming or prompting commands in various languages.

VCRs generally come equipped with programming commands pre-stored in the VCR's permanent memory in a local language format, which are later displayed on a TV screen
15   during programming operation. For instance, English would be the local language pre-stored in the VCR's permanent memory for VCRs sold in the United States. However, if the television viewer programming the VCR does not read English, it can make the difficult task of programming a VCR even that much more difficult.

20   To facilitate the process for the viewer, VCR commands will now be displayed in a variety of foreign languages. These foreign language commands, while not pre-stored in the VCR's permanent memory, will be brought to the viewer across the television signal coming into the viewer's home. This invention eliminates the need to take a VCR back to the manufacturer to have the VCR's permanent memory replaced each time a different language command set
25   is desired.   Television signals are composed of a program signal, the portion of the signal that transmits the TV picture, and a vertical blanking interval (VBI), the portion of the signal that stores various data types or messages. The VBI will be used to bring the foreign language VCR commands into the VCR and then stored in the VCR's temporary memory. The viewer can then select the foreign language of choice from options displayed on the screen and thus,
30   program the VCR in his or her native language.

Summary of the Invention

According to the invention, foreign language VCR and/or television commands are
35   transmitted to the viewers home, in the VBI or via another transmission link. The foreign language commands are then stored in the temporary memory for later use. Each set of foreign language commands also contains a unique language identifier used to create the menu

of options available to the viewer. For example, if Spanish, French, and Chinese foreign language commands are available in the VBI, the viewer menu would display these languages

5   as well as English on the TV screen for the viewer to use to select his or her options.

During operation, the viewer uses the TV remote control to select the language of his or her choice from the menu displayed on the television screen. The language identifiers available are compared with a user inputted language identifier. The foreign language

10   commands corresponding to the user inputted language identifier are stored in the temporary memory for display on the television screen. If no foreign language command sets are stored, the local language pre-stored in permanent memory will be displayed on the television screen.

Preferably, a microprocessor is programmed to seamlessly retrieve the commands in

15   the desired language for display on the television screen.

Brief Description of the Drawings

The features of a specific embodiment of the best mode contemplated of carrying out the

20   invention are illustrated in the drawings in which

FIG. 1 is a schematic block diagram of a microprocessor controlled television receiver and/or VCR programmed to practice the invention;

25   FIG. 2 is an diagram representing data transmitting in the VBI;

FIG. 3 is a diagram representing equivalent data that illustrate the operation of the invention; and

30   FIG.4 is a television screen display of a menu for viewer selection of the language for the commands.

Detailed Description of the Specific Embodiments

35   The invention contemplates the transmission of foreign language translations of a command set, called equivalent data, to be displayed on the screen of television receivers instead of a local language version of the command set. The command set can represent

on-screen prompts to guide the viewer in programming a VCR or performing other VCR and/or television related tasks such as initial setup or sound or picture adjustment. The transmitted equivalent data includes a plurality of foreign language translations of, or graphical data representations of, the local language and a plurality of language identifiers, each being unique to one of the foreign language translations or graphical data representations. The invention is described below in conjunction with a cable television service, but it can also be used in a satellite or broadcast television service.

A host program source and a source of equivalent data at the headend of a television transmission system are coupled to a vertical blanking interval (VBI) encoder to insert the equivalent data into the VBI of the television signal. Alternatively, the equivalent data could be transmitted on a subcarrier of the television signal, a telephone connection, or by other known means for carrying data. Preferably, the equivalent data is repeated continuously all the time that the source is sending out a television signal.

In FIG. 1, the television signal is brought into the viewer's home at a cable subscriber drop 17. The television signal, which contains the transmitted equivalent data, is coupled by a tuner and demodulator 19 to a VBI decoder 30. Decoder 30 strips from the television signal the equivalent data transmitted in the VBI, which is then fed to a microprocessor 22. Microprocessor 22 includes temporary storage in the form of a RAM 18. The equivalent data is stored in RAM 18. The program signal portion of the television signal is fed to a television screen 21.

A remote controller 23 is coupled to microprocessor 22, typically by an infrared transmission link. Microprocessor 22 accesses a system memory 24 in which the local language version of the command set is stored. System memory 24 is typically a ROM or other nonalterable data storage device. Typically, the local language version of the command set is loaded into system memory 24 in the factory during the manufacturing process. Microprocessor 22 decides what data is to be displayed, either the local language stored in system memory 24 or the equivalent data stored in RAM 18. The data to be displayed is composed by microprocessor 22 in a video processor 26, in well known fashion, and then sent to television screen 21 for display.

FIG. 2 depicts equivalent data 32 carried in the VBI. A header field 34 designates the beginning of the equivalent data and controls operation of decoder 30 with clock run in

and framing code information. Following header field 34 are the foreign language translations or graphical data representatives of the command set represented by encoded

5   textual data 36a, 36b, ..., 36n, each of which is preceded by a unique language identifier field 38a, 38b, ..., 38n, respectively. As described below in more detail, the individual commands preferably each have an address that defines the location on screen where such command is to be displayed. The same address is thus used for a given command in each language. The language identifiers represent foreign language options, for example

10   French, Spanish, Chinese, etc.

In operation, the viewer presses a set up key on remote controller 23 to initiate a set up mode and then keys in his or her preference of foreign language. Specifically, the viewer selects the foreign language from an on-screen menu shown in FIG. 4. The default

15   selection marked with a cursor 50 is the local language, e.g., English. To select a different language the viewer moves cursor 50 by operating arrow keys on controller 23 and then depresses an enter key on controller 23. The corresponding language identifier is retrieved by microprocessor 22 for comparison with the language identifiers transmitted in the VBI. When a match is detected by microprocessor 22, the corresponding language textual data is

20   "grabbed" from the VBI and downloaded to RAM 18. For example, if the viewer wishes to select the Spanish language equivalent data set, he or she moves cursor 50 and enters that choice into remote controller 23. In such case, microprocessor 22 displays the commands in the selected language. If no equivalent data set is stored in RAM 18, i.e., if the viewer does not select a foreign language, microprocessor 22 displays the local

25   language version of the commands stored in system memory 24.

Although it is preferable to store only a single foreign language command set in RAM 18 to minimize the amount of data storage, all, or at least more than one, of the foreign language command sets could be downloaded to RAM

30   18 and the selection of the desired foreign language for display could be made by the viewer after the data is downloaded.

In FIG. 3 there is one equivalent data set for each language identifier. For example, if the local language commands include "time, channel, hour, day," the Spanish command set

35   44 includes "tiempo, canal, hora, dia," and the French command set 46 includes "temps, chaine, heure, jour." The individual commands of each set also have addresses to designate where they are to be placed on the screen to create the desired message. For example,

command set 44 has addresses 44a and commands 44b, e.g., "tiempo", and command set 46 has addresses 46a and commands 46b, e.g., "temps". The same address is used for a

5   given command, regardless of the language, e.g., "001" for tiempo and temps, because the address identifies the location of the command displayed on the screen. The same addresses are also used for the local language command set stored in system memory 24, i.e., "001" for temperature. In other words, the address of each local language command in system memory 24 is the same as the address of the corresponding foreign language

10   command in RAM 18.

Alternatively, a different address structure could be used for the local language command set, so each television manufacturer could select its own address structure. In this case, a table is downloaded to RAM 18 in the VBI after the viewer keys in a

15   identification code for h/her particular television model and brand to relate the addresses of the native language to the addresses of the foreign language.

Microprocessor 22 is programmed to operate seamlessly regardless of the language selected by the viewer. A status bit is stored in microprocessor 22. The status bit is one

20   value i.e., binary "1", if a foreign language command set is downloaded to RAM 18, i.e., the downloaded foreign language is to be displayed, and the status bit is the other value, i.e., binary "0", if no foreign language command set has been selected, i.e., the local language is to be displayed. When microprocessor 22 makes a call for a command in the course of its operation, an address is issued to designate the screen location of the

25   command. Microprocessor 22 checks the status bit to determine its value. If the status bit is a binary "1", the address is routed to RAM 18 to retrieve the foreign language command to be displayed at the screen location designated by the address. (If a table is stored in RAM 18, the issued address is converted by reference to the table to an address that designates the screen location at which the foreign language command is to be displayed.)

30   If the status bit is a binary "0", the address is routed to system memory 24 to retrieve the local language command to be displayed at the screen location designated by the address.

Since not all television receivers come with a local language stored in system memory 24, all of the equivalent data sets, including the local language, can be transmitted and

35   stored in microprocessor RAM 18. In this case, there is no default language choice and the viewer must make a choice from the menu of FIG. 4.

The described embodiments of the invention are only considered to be preferred and illustrative of the inventive concept; the scope of the invention is not to be restricted to such embodiments. Various and numerous other arrangements may be devised by one skilled in the art without departing from the spirit and scope of this invention.

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WHAT IS CLAIMED IS:

5   1.   A system for displaying textual or graphic data on the screen of television receivers, the system comprising:

a system memory at each receiver, data representing local language commands being stored in the system memory;

a microprocessor;

10   means for configuring the microprocessor to display on the screen local language commands stored in the system memory;

a source of equivalent textual or graphic data;

means for transmitting the equivalent data to each receiver; and

means for configuring the microprocessor to substitute a corresponding part of the
15   equivalent data for the displayed commands.

2.   The system of claim 1, in which the transmitting means comprises means for inserting the equivalent data into the VBI of a television signal transmitted to each receiver.
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3.   The system of claim 2, in which the microprocessor includes a RAM in which the transmitted equivalent data is stored.

4.   The system of claim 3, in which the system memory is a ROM.
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5.   The system of claim 4, in which the transmitted equivalent data includes unique language identifiers.

6.   The system of claim 4, in which the configuring means compares the language
30   identifiers with a viewer choice and stores the corresponding equivalent data in the RAM when a match occurs.

7.   The system of claim 4, in which the storing means comprises means for storing the equivalent data in the microprocessor RAM.
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8.   The system of claim 7, in which the means for configuring the microprocessor to select the data to be displayed comprises:

5   displaying the unique language identifiers of any available equivalent data;

            displaying the unique language identifier of the local language;

            inputting a choice; and

            comparing the inputted choice with the unique language identifiers.

10   9.   The system of claim 8, in which the means for configuring the microprocessor to display on the screen the data selected to be displayed comprising a means for the microprocessor to display the selected foreign language translation or graphical representative stored in the RAM or the local language textual data stored in system memory, corresponding to the inputted choice, and in the absence of any selection,

15   defaulting to the local language textual data stored in system memory.

10. The system of claim 3, in which the system memory is the RAM in the microprocessor.

20   11. The system of claim 10, in which the equivalent data includes a plurality of textual or graphical data sets and a plurality of language identifiers each being unique to one of the textual or graphical data sets.

12. The system of claim 11, in which the storing means comprises means for storing

25   the equivalent data in the microprocessor RAM.

13. The system of claim 12, in which the means for configuring the microprocessor to select the data to be displayed comprises:

            displaying the unique language identifiers of any available equivalent data;

30   inputting a choice; and

            comparing the inputted choice with the unique language identifiers.

14. The system of claim 13, in which the means for configuring the microprocessor to display on the screen the data selected to be displayed comprising a means for the

35   microprocessor to display the selected textual or graphical data sets stored in the system memory, corresponding to the inputted choice.

15. A method for displaying textual or graphic data on the screen of television receivers comprising the steps of:

5   displaying local language commands on the screen of a television receiver;

transmitting to the television receiver equivalent data, the equivalent data including a plurality of foreign language translations of, or graphical representatives of, the local language commands;

choosing one of the transmitted foreign language translations;

10   substituting the chosen foreign language translation for the displayed local language command.

16. The method of claim 15, additionally comprising the steps of:

attaching to the transmitted equivalent data a plurality of language identifiers, each

15   being unique to one of the foreign language translations or graphical data representations;

inputting a choice;

comparing the inputted choice with the unique language identifiers; and

storing the equivalent data when a match occurs in the comparing step.

20   17. The method of claim 14, in which the inputting step comprises selecting a choice from an on-screen menu.
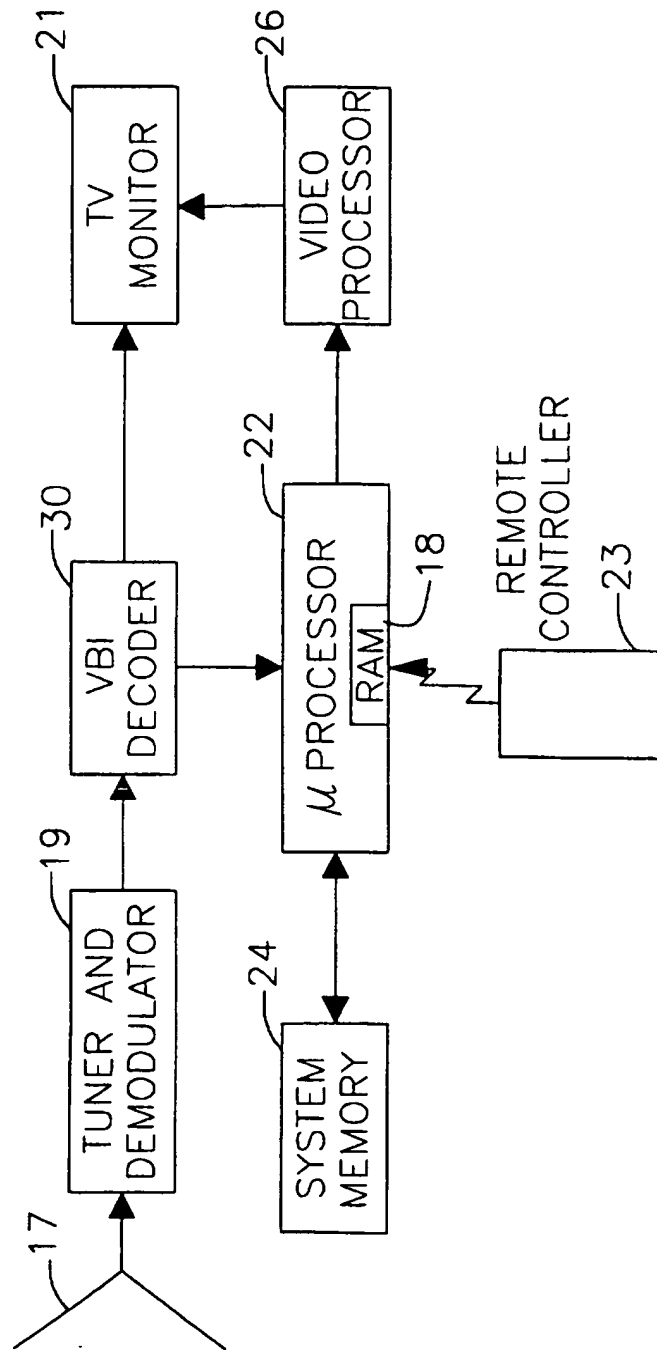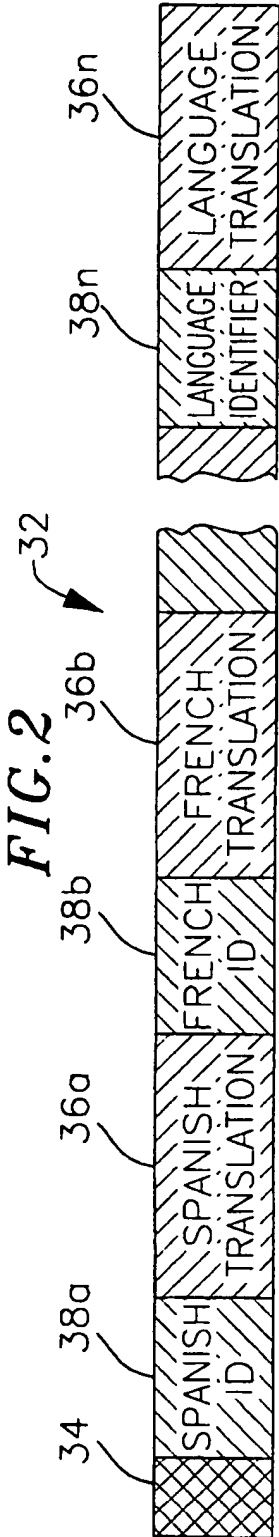
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FIG.1

FIG.2

FIG.3
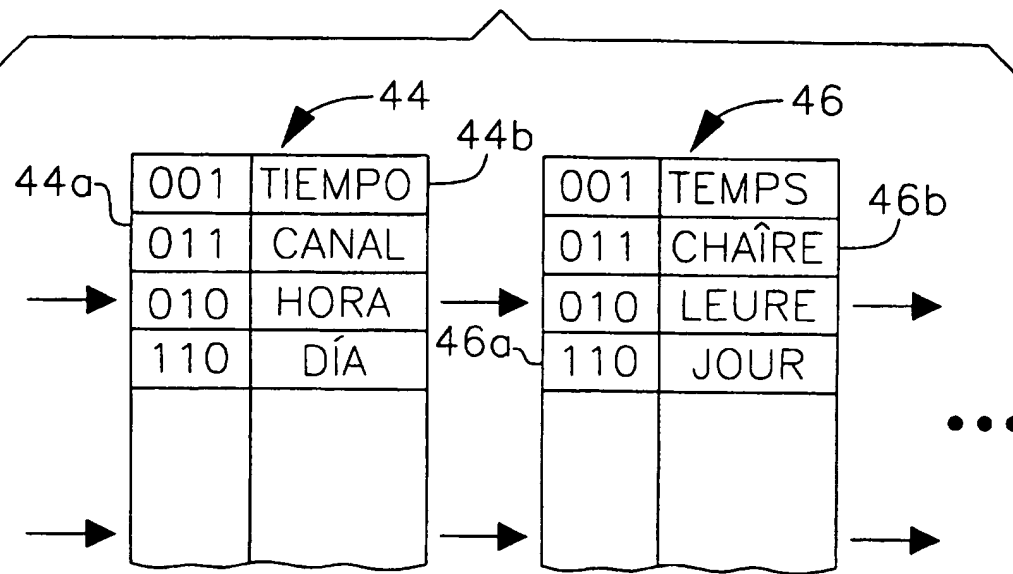
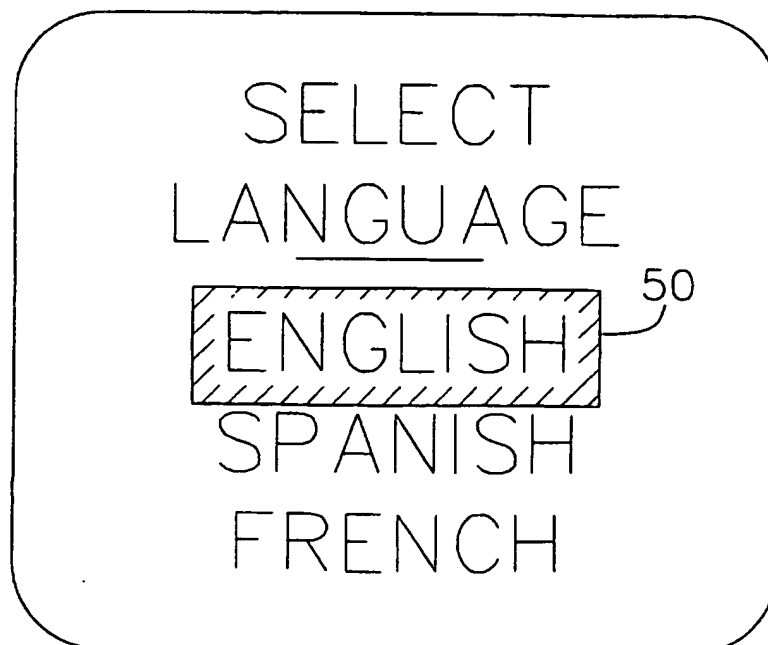| 001	TIEMPO
011	CANAL
010	HORA
110	DÍA

44a · 44 · 44b

001	TEMPS
011	CHAÎRE
010	LEURE
110	JOUR

46 · 46a · 46b

. . .

FIG.4

SELECT
LANGUAGE
ENGLISH — 50
SPANISH
FRENCH

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :H04N 7/00, 11/00, 5/445, 7/08, 7/084, 7/087
US CL : 348/460, 461, 553, 563
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/460, 461, 468, 553, 563, 569, 477, 478, 479, 474, 473, 478, 434, 435, 433

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS
search terms: language, close# caption, osd, on(w)screen, tv, television.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,570,134 A(HONG) 29 October 1996, col. 1, lines 19-22, col. 2, line 65, col. 3 line 2, col. 4, lines 49-55 and 57-60, col. 5, lines 10-18, col. 6, lines 7-13, .	1-4
Y,P		5-17
Y	US 5,459,522 A(PINT) 17 October 1995, col. 2, line 1.	2
X	US 5,036,394 A (MORII et al) 30 July 1991, col. 1, lines 5-10, fig. 1.	1
Y		2

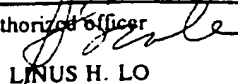| X | Further documents are listed in the continuation of Box C. | | See patent family annex. |

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 JANUARY 1997	U 5 MAR 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized Officer LINUS H. LO
Facsimile No. (703) 305-3230	Telephone No. (703) 305-4039

Form PCT/ISA/210 (second sheet)(July 1992)*

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,434,776 A (JAIN) 18 July 1995, col.2, lines 18-60.	1, 3-17

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